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EXPERIMENTS WITH NARCOTINE.*

Results of Experiments and Observations on Narcotine.† By WILLIAM TULLY, M.D. Professor of Materia Medica and Therapeutics in the Medical Institution of Yale College.

IT is now many years since the discovery of that proximate principle of Opium, commonly called Narcotine, and even a considerable number since it has been known to be capable, in certain doses, of destroying brute animals, with the phenomena usually produced by a *narcotic*; and yet, I have no knowledge of any experiments or observations, hitherto, that can be considered as contributing much, if indeed anything, towards the determination of its medicinal powers upon the human subject. As far as I know, most of the late writers upon Materia Medica have concurred in ascribing all the remedial properties of Opium, to some salt of Morphine (another proximate principle of this drug), although it is admitted that Opium contains only about seven *per centum* of Morphine, and that a given quantity of Morphine is very far from being fifteen times as active as the same quantity of Opium, which ought to be the fact were Morphine its sole medicinal principle. According to the best observations, a given quantity of Morphine, instead of possessing fifteen times the activity of the same quantity of Opium, can at most be considered as possessing only about four times the activity, and perhaps there is room for just doubt whether there is even as much difference as this. Now it cannot be reasonably supposed that as much as seventy-two *per centum* of the Morphine is lost, in the process for its separation from Opium, and therefore it is altogether probable, *a priori*, that there is another principle, upon which its virtues may in part depend, more especially as the *Strychnos Nux-Vomica*, and several species of *Cinchona*,

* This article is republished, at the author's request, from the American Journal of Science for July. Some future numbers will contain a communication from Dr. Tully, prepared for this Journal, giving the details of these experiments.—*Ed. Bos. Jour.*

† It is well observed by a distinguished pharmacist, that the original ending in *ia*, (*ia* in English,) of the names of the vegetable salifiable bases, *must* be retained by physicians, to the exclusion of the termination in *a* simply, or *ia*, which has been recently adopted by the chemists, since the similarity of *Atropia* to *Atropa*—of *Daturia* to *Datura*—of *Brucia* to *Brucia*—of *Sanguinaria* to *Sanguinaria*—of *Cinchonia* to *Cinchona*—of *Gentiania* to *Gentiana*, etc. (the former of which are the present fashionable names for the active principles, and the latter the long established names for the vegetables from which they are obtained,) is altogether incompatible in prescription with the safety of patients. In all the editions of Magendie's *Formulary*—in Anthony Todd Thomson's *Concise System of the British Pharmacopoeias*—in Remond's *Supplement to the British and French Pharmacopoeias*—and (as has been said) in some of the latest *Pharmacopoeias* of the continent of Europe, the termination in *ia* is retained. It was to be hoped that the responsibility of a needless change in nomenclature which, if adopted, would endanger so many lives, would never be assumed by any practitioner of medicine.

are now well known to contain two principles, possessing medicinal powers, similar in kind, and differing mainly in degree. Nothing else beside Narcotine, and another very doubtful substance called extractive matter, having, as is said, an intensely bitter taste, has yet been obtained from Opium, which can reasonably be suspected of contributing to its remedial effects.

For the purpose of ascertaining the precise powers of Narcotine, I have recently instituted a course of experiments, fourteen in number, upon healthy subjects it is true;* but they have afforded results much more satisfactory, and without doubt much more analogous to what will be its effects in disease, than could possibly be obtained from experiments upon brute animals, and especially on those which have suffered the lesion of a ligature upon the *cesophagus*, immediately after being forced to swallow the agent whose powers are to be ascertained. As a detail of the experiments themselves would probably be incompatible with this *Journal of Science*, it will be reserved for some journal exclusively medical, and this communication will contain only a summary of the results obtained by the experiments in question, preceded by a few definitions, which are necessary to show the precise acceptations in which I employ the terms that will be applied to the several operations of the Narcotine.

In regard to the subjects of my experiments, it is not necessary to make any further statements, than barely to say that one was a young physician belonging to the State of Massachusetts—that another belonged to the State of New York—that two others belonged to Connecticut—and that I was myself the fifth subject. The four gentlemen, above mentioned, happened to be in New Haven together and at leisure for about a week, and they therefore volunteered their assistance in this business, entering into it with a degree of interest and zeal, which fully evinced that with them their profession is not viewed as a mere trade, to be followed only for the purpose of obtaining a support, or as a means of acquiring wealth, but is rather esteemed a liberal art, which they cultivate with much more generous and honorable motives.

It may be proper to state in this place, that I once made a series of experiments of the same sort, upon the Sulphate of Morphine; and that a subsequent employment of that article, in my medical practice, has abundantly confirmed all the conclusions to which I then arrived—and, it is true, has led to some others, which could not be obtained upon a healthy subject. The results of my experiments upon the Sulphate of Morphine, and of my subsequent observations upon its operation in disease, will be subjoined to this paper on Narcotine, as in some instances my descriptions of the effects of each have necessarily been comparative.

Definitions.

A narcotic operation consists of four parts, stages, or degrees, viz.

1st. An *antirritant* stage, in which morbid irritability and irritation, and irritative action generally—morbid sensibility, restlessness and jac-

* It is altogether probable that the state of health may be taken as a medium state of susceptibility to the influence of this article. Under certain circumstances, much more may be required, and under certain other circumstances, much less, in order to produce given effects.

titation, (when connected with a non-phlogistic, or a positively atonic condition of the system,) are allayed ;

2d. An *anodyne* stage, in which pain, (when connected with a non-phlogistic, or a positively atonic condition of the system,) is relieved ;

3d. A *soporific* stage, in which sleep is produced ; and

4th. *Ultimate narcosis*, in which there is vertigo, headache, faintness, dimness or imperfection of vision, nausea and retching, epigastric uneasiness, small and irregular pulse, cold extremities, cold, clammy, or slippery sweats, delirium, stupor, convulsions (either common, epileptic, or tetanic), coma, and death. I am confident, from multiplied observations, that all *narcotics* are necessarily *stimulants*.

A state of prostration, (not exhaustion or debility, as is commonly, but erroneously supposed,) sometimes takes place, as an indirect effect, and rather a remote consequence, of a single dose of certain *narcotics*, too large for the susceptibility of the patient. This state is characterized by vertigo, nausea and vomiting on motion, and headache and faintness. Although these symptoms constitute a part of what I have described as *ultimate narcosis*, yet *ultimate narcosis* takes place while a patient is under the fullest operation of the *narcotic* agent, and this sort of prostration takes place only after all the direct effects of the *narcotic* agent have passed off, and it is rather a sequel than a direct effect of such an agent.

Different *narcotics* vary very much in the relative degree of each of these states or stages of a *narcotic* operation, which they respectively produce. Each state or stage of a pure *narcotic* operation, may be considered as a strictly *sedative* operation.

A *nervine* operation consists exclusively of four states, stages, or degrees, viz.

1st. A moderate antirritant stage, indicated by more or less relief of the same symptoms, that are obviated by the first degree of a *narcotic* operation. I do not suppose that the *antirritant* effects of a *nervine* are identical with the *antirritant* effects of a *narcotic* ;—they appear to constitute distinct sorts of *antirritant* effects ;

2d. The production of a peculiar calm, placid, and pleasurable sensation ;

3d. The production of a peculiar preternatural wakefulness ; and

4th. The production of more or less positive exhilaration, sometimes amounting even to delirium.

Different *nervines* also vary very much in the different relative degree of each of these states or stages of a *nervine* operation, which they respectively produce ; and many are altogether incapable of producing the fourth state, or stage, in any appreciable degree.

Pure *nervines* may be pushed to any extent whatever, within the capacity of the stomach to contain, without producing a single individual of those symptoms which I have detailed under the denomination of *ultimate narcosis*, and without the least increase of the vital energies generally, or of the strength of arterial action, which is a test always adequate to the perfect distinction of pure *nervines* from pure *narcotics*, and pure *stimulants*.

It is very common to confound a *nervine* operation with a *stimulant*

Experiments with *Narcotine*.

one ; but they are perfectly distinct. All the parts of a *nervine* operation (as I have just said) may be produced without any increase of the vital energies, and without any increase of the strength of arterial action. Indeed, I have very often seen the fullest *nervine* operation connected with an extreme reduction of all the vital energies, and with such a diminution of the strength of arterial action, that the pulse could scarcely be felt.

A *stimulant* operation consists exclusively in a quickly diffused, and transient increase of the vital energies generally, and a similar increase of the strength of arterial action. *Stimulants* usually diminish atonic morbid frequency of the pulse ; but, in perfect health, they usually (though not invariably) increase the frequency a few beats. *Stimulants* also commonly diminish, in a slight degree, both morbid irritability and irritation, and irritative action generally ; morbid sensibility and sensation ; morbid mobility, restlessness, and jactitation ; but they do this in a less degree even than the *nervines*, and still less than the efficient *narcotics*, and, as I think, doubtless in a manner different from either. Pure *stimulants* never produce the least trace of the last three states or stages of a *nervine* operation, nor a single symptom of what constitutes *ultimate narcosis*, with the occasional exception of nausea and vomiting, and perhaps headache, from the mere irritation of excessive doses or quantities ; nor do they ever produce any condition at all analogous to the secondary and rather remote sort of *prostration*, which, I have already mentioned, as sometimes the sequel of too large a single dose of certain *narcotics*. These circumstances afford absolute tests of pure stimulant powers.

It must be remarked that *narcotic* and *nervine* powers are principally exerted upon the nervous system, while *stimulant* powers are mainly exerted upon the sanguiferous system ; and, particularly, that the first three states or stages of a *narcotic* operation—the whole states or stages of a *nervine* operation—and a perfect *stimulant* operation, are by no means incompatible with each other. Thus, for example, a full and complete *antirritant* operation, as produced by Opium—a perfect *anodyne*, and a prominent *soporific* effect, may take place, at one and at the same time, with a most decided increase of the vital energies generally, and of the strength of arterial action ; and either or both of these operations may or may not be accompanied, at one and the same time, with all the states or stages of a *nervine* operation. *Sedative* effects, then, are by no means incompatible with *stimulant* effects. What is called *ultimate narcosis*, at least in any prominent degree, does in fact seem to be incompatible, either with positive *nervine* or *stimulant* effects.

The conjunction, at one and the same time, of full *stimulant* effects, with the three first states or stages of a *narcotic* operation, may be witnessed in a prominent degree by the use of moderate and uniform doses of Opium and Alcohol, at regular and short intervals, for a certain length of time, in any case to which both are appropriate remedies.

That *narcotic*, *nervine*, and *stimulant* operations, as here defined, are perfectly distinct operations, is abundantly proved by the fact that there are numerous articles which possess each individually, without any trace of the others ; and the circumstance that two of these groups of effects, or even the whole three, are not unfrequently produced by the same

articles, no more proves their identity, than the circumstance that Tobacco is both *narcotic* and *cathartic*, proves that these two effects are identical.

Results of Experiments with Narcotine.

1st. In the same quantities, Narcotine is far less operative upon the human system, than the Sulphate of Morphine, and even less so than Opium.

2d. Narcotine possesses the same degree of activity, when given pure and in substance, as in any other way tried, its virtues not being either enhanced or diminished by solution in oil, or in dilute Acetic acid.

3d. From two to five grains of Narcotine appear to constitute a medium full dose, where only a single dose is to be taken; i. e. such a dose as will just fall short of producing any disagreeable effects, in a person of ordinary susceptibility.

4th. One grain of Narcotine appears to constitute a medium moderate dose, to be repeated at regular and short intervals;—and three hours appear to constitute a medium suitable period of repetition for such a dose, for a person of ordinary susceptibility.

5th. Narcotine is slower, though it is less prominent in its effects, than the Sulphate of Morphine. The period required for the first manifestation of the several effects of Narcotine, is intermediate between that required for the effects of Sulphate of Morphine, and that required for the effects of Opium; and the period of their duration is intermediate between that of the effects of Opium, and that of the effects of Sulphate of Morphine.*

6th. Narcotine appears to be more or less *nervine*. The general *nervine* operation of Narcotine, I think is decidedly less than that produced by Sulphate of Morphine, but I am not certain that it is less than that of Opium. Narcotine does not appear to produce any of that pre-ternatural watchfulness, which so often results both from Sulphate of Morphine and from Opium. From the circumstance that Sulphate of Morphine possesses this last-mentioned property in an eminent degree, and that Narcotine is destitute of it, it follows that the same property of Opium is dependent upon its Morphine, and not upon its Narcotine. In short, the quality of the *nervine* operation of Narcotine is considerably different from that of Sulphate of Morphine, and consequently more or less different from that of Opium.

7th. Narcotine appears to be considerably diaphoretic, and it commonly produces more or less itching of the whole surface, which is first perceived, and is most considerable, on the inside of the thighs and about the nose.

8th. Narcotine is most prominently and most decidedly narcotic.

As soon as it begins to produce a decided effect upon the system, it occasions a very peculiar expression of the countenance, which is more easily recollected than described. There seems to be a peculiar elongation of all the features, and a kind of lateral shrinking of the whole face, which, together with the effect upon the eyes, and particularly the con-

* It is remarkable that Morphine, which is much more speedy in its operation, appears to be more permanent in its effects than Opium.

traction of the pupils, more unequivocally indicates the operation of a narcotic, than any expression of the countenance which is produced within my knowledge by any other agent. While in the early stages of its operation, and before my family knew anything of the experiments, one individual of them after another noticed this expression, and made remarks upon it. One said I appeared as if about to be attacked with some acute disease—another inquired if I had got *Sick headache* (to which I am subject), and each made some comment. Similar remarks were made to the other gentlemen. One was met in the street by another physician, who immediately pronounced that he was under the influence of some active narcotic.

Narcotine very materially and very greatly reduces the frequency of the pulse; it allays very effectually certain sorts of cough; it occasions indistinct vision, or the sensation of a blur before the eyes; and when a person is strongly under its influence, it occasions a contraction of the pupils. It produces also a sensation of dryness and clamminess in the mouth, though it appears sufficiently moist to the eye; and it produces not only a change in the sound of the voice (while a person is under its influence), but likewise very considerable hoarseness. These effects occasionally take place quite early in its operation. It produces not only a considerable diminution of the natural excretion by the renes, but also a deficiency of contractile power, or torpor of the bladder.

Whether Narcotine is constipating or not, may perhaps be considered as somewhat uncertain, but it is most probable that it is so. While experimenting upon it, one of the gentlemen had a regular daily alvine discharge; but on account of a much greater susceptibility, he took considerably less of it than the other gentlemen. On the contrary, one gentleman had none for three days, while taking it; and another gentleman had none for five, and I think six days, while under its use. Since the completion of the experiments, I have known it taken twice, for a moderate diarrhoea, with perfect relief of the disease. It may, however, possess the power of relieving diarrhoea, i. e. of obviating morbid irritability, and irritative action of those muscular fibres, which produce the peristaltic motion of the intestines, without being liable to produce constipation; i. e. to lessen healthy excitability, and natural peristaltic motion. The resin of the *Zanthorrhæa hastilis* operates in this manner.

The *antirritant* effects of Narcotine appear to be greater, in proportion to its other powers, than the *antirritant* effects of Opium; and also, as appears to me, than the *antirritant* effects even of Sulphate of Morphine. Its great power of diminishing the frequency of the pulse seems to indicate this, as well as its power of allaying certain sorts of cough. No opportunity has occurred of testing the *anodyne* powers of Narcotine. It will be obvious that this cannot be determined upon a healthy subject. The *soporific* effects of Narcotine appear to be considerably greater, in proportion to its other powers, than the *soporific* effects of Sulphate of Morphine, or than the *soporific* effects of Opium. The sleep produced by it, even when taken in a moderately excessive dose, is peculiarly calm, light, placid and easy;—and even when it is the most intense, the subject of its influence is easily roused; and by voluntary bodily motion and exertion, he can easily keep himself awake, and ap-

parently very much diminish its general influence upon his system—and yet, as soon as he sits down, and remains quiet for a short time, its full influence speedily returns. During the deepest sleep produced by Narcotine, the respiration is light and easy, like that of a person in health, who has been some time perfectly at rest. When the subject of its influence awakes spontaneously from the sleep which it produces, he feels no heaviness, and nothing unnatural, but much as on awaking in the morning from an ordinary night's rest, except that he has a slight sensation of dryness and clamminess in the mouth, a considerable hoarseness, diminished renal secretion, and diminished contractility of the bladder.

In a moderately excessive dose, in relation to the susceptibility of the system, Narcotine produces a mazy and confused state of the head, vertigo, nausea and vomiting. Too large a quantity in the twenty-four hours operates in the same manner. But the effects of a moderately excessive dose of Narcotine, are much less disagreeable than the effects of an excessive dose of the Sulphate of Morphine, or of Opium. The mazy and confused state of the head, and even the vertigo which it produces, are attended with a decidedly pleasurable state of the feelings; and even the nausea and vomiting which it occasions, are by no means distressing, and are far less unpleasant than the similar symptoms produced by Sulphate of Morphine, and by Opium. The nausea and vomiting which a moderately excessive dose of Narcotine produces, begin almost instantaneously, and terminate as suddenly; and, in a very short time, no sensations remain, which indicate that nausea and vomiting have occurred at all,—there is no violent straining, no weakness, soreness, or stiffness afterwards.

According to Magendie, and others, the *ultimate narcosis* of Narcotine is made up of the following symptoms, viz.: signs of fright; backward movements, with incapacity of advancing; frothing at the mouth; agitating or tremulous convulsions of the jaws; general convulsions of the common sort; tetanic spasms of the extensor muscles of the neck, throwing the head backwards upon the spine; a stupor, in which the eyes remain open, but from which the subject cannot be roused, and under which he dies in the course of twenty-four hours. These last seem to be the only effects of Narcotine that have been heretofore fairly determined, either in Europe or this country, at least within my knowledge. It is obvious that these could not be verified on the human subject, nor is it necessary to know them, for the therapeutic application of this agent, in the treatment of human diseases. Magendie says that these effects are similar to those produced by fatal doses of Camphor; and what is remarkable, he pronounces them to be mere *stimulant* effects, and not at all indicative of any *narcotic* powers! I wish that Magendie had given us his precise views of the true nature of an *ultimate narcotic* operation, for I cannot conceive of a purer one than is indicated by this aggregate of symptoms. I venture to assert on the one hand, without the least fear of contradiction, that if no articles which are capable of producing effects of this general character, are suffered to retain their place among the *narcotics*, our catalogue of this class of agents will become extremely meagre; and, on the other, that there is not a pure and unequivocal *stimulant*, that is capable of producing any such symptoms.

9th. Narcotine appears to be entirely destitute of all *stimulant* powers, whether it is given in single full doses, or in moderate and uniform doses, at regular and short intervals. My attention, during the whole of my experiments, was particularly turned to the question of its *stimulant* operation; and in no case, while under its influence, was there the least perceptible increase of the vital energies, or of the strength of arterial action, or even of animal heat; nor was there any sensation of fulness or throbbing in the head; nor, indeed, did any symptom whatever occur, which could by any means be construed into an effect of this sort. On the contrary, there was invariably a great reduction in the frequency of the pulse, in two cases as great as twenty-six beats in a minute, and in none less than eighteen, in the same time. In some of the cases there was a decided diminution, both in the force of the pulsation and the fulness of the artery, and probably more or less in all, though in some it was so inconsiderable as to be of very little consequence. These effects, I repeat, occurred equally, whether the agent was given in single full doses, or in moderate and uniform doses, at regular and short intervals; and whether taken in substance, or dissolved in dilute Acetic acid, or in Olive oil. The power of producing preternatural watchfulness, even were it possessed by Narcotine, would not indicate any *stimulant* properties, but rather mere *nervine* ones, which are entirely distinct. The power of producing vertigo, headache, faintness, nausea, vomiting, irregular pulse, cold extremities, etc. is not the result of a *stimulant* operation, but of a *narcotic* one; and both Morphine and Narcotine are capable of producing all of these last effects, though Morphine more eminently than Narcotine.

If these results can be considered as at all correct (and I cannot discover where there is any possible source of fallacy), the futility of what is called *denarcotizing* Opium, as a means of improving its medicinal operations, will at once be manifest. However, as the effects of Morphine and Narcotine differ considerably, not only from each other, but also from Opium, it is undoubtedly useful to have each of these proximate principles in a separate state, that we may be able the more accurately to adapt our remedial agents to the peculiar circumstances of a given case.

What quantity *per centum* of Narcotine is contained in Opium, I know not.* As, in a given quantity, it is less active than Morphine, and even less so than Opium itself, no quantity of it, however large, will account for the full effects of Opium, upon the supposition that we are correct as to the proportion of Morphine. But I do not esteem it by any means impossible, that the *bitter principle* already referred to, as being called by the vague name of *extractive* (if indeed there is any such distinct principle), or perhaps some other part of this complex drug, may yet be found to contribute something to its medicinal effects.

* It has been said (but upon how good authority I cannot decide), that Opium usually contains about twice as much Narcotine as Morphine.

REMARKABLE CASE.

Communicated for the Boston Medical and Surgical Journal.

MR. EDITOR,—The following case has attracted considerable attention from the medical faculty in this vicinity, for several years ; and from a recent occurrence which took place in the case, it has become doubly interesting, and it is thought to be worthy of record among the medical wonders of the age.

A Mrs. Reed, now aged about forty, naturally of a good constitution, enjoyed a comfortable state of health until about the year 1817. While pregnant with a pair of twins, a small umbilical rupture took place from the excessive distension of the abdominal parietes, not larger, as she says, than an English walnut, and which nearly disappeared after delivery. Soon after this period she discovered a tumor in the lower part of the abdomen, which gradually increased in size, became painful, and greatly impaired her general health. It presented a solid but rather unequal surface, and often caused what resembled parturient pains, and not unfrequently attended with some discharge. She, however, became anasarcaous, which rendered her extremely large, and, to appearance, very near her end. Her breathing became very laborious, and it was with difficulty that she could walk or lie down. But observing that the water exuded from her legs through the skin, I made several punctures with a lancet, which discharged freely for several days, and by the use of a few simple medicines the water unexpectedly subsided, and left her apparently free from dropsy, and so much relieved that she was able to perform the usual labor of her family with but very little help. The abdomen, however, remained much distended by the original tumor. The absence of the water led to the discovery of another swelling in her right side, extending from the spine of the ilium to the diaphragm. This last tumor was discovered about 1825-6, and both together caused the most extreme suffering from the pain of distension ; and she several times sent for the neighboring physicians, and entreated them to open her side and give vent to what she believed to be a collection of fluid : but on examination, the tumor appeared solid and without any fluctuation, so that her requests were never complied with. After the above-mentioned period of 1826, the abdomen began to be more distended, from what appeared to be an *Ascites*, presenting a uniform surface, and the distinctness of the tumors became less apparent. As the disease progressed, the umbilical tumor protruded, and eventually formed a bag of an irregular shape ; the apex, which was the *umbilicus*, being elevated about five inches from the abdominal surface, and in the middle seven or eight inches in circumference, with two lateral processes resembling nipples, about one inch in length. The existence of this singular tumor was unknown to any one but herself until after an occurrence took place, which I am about to mention.

On the night of the 17th instant (July), I was called upon to visit this woman in great haste, as a tumor had burst and was discharging profusely. On my arrival, a distance of four miles and an half, I found her sitting in her chair, with her clothes on, and her finger on the aperture to prevent any further discharge until my advice could be obtained. On inquiry, she told me she went to bed as usual, and about twelve o'clock she was awakened by a discharge from a tumor on her bowels, which had burst.

She got up and dressed her as quick as her situation would permit, with the assistance of her daughter, and had saved three pints in a pot, besides what escaped among the bed clothes. I now found out, for the first time, the existence of such a tumor on her bowels. The friction from the pressure of the finger, for nearly two hours, had enlarged the orifice so much, that on my ordering her to let it run, it would fill a common sized pot in less than a minute. About twelve pounds were drawn off while she sat in her chair, and being faint, she was laid on the bed, herself commanding the orifice with her finger ; and after a short interval, three pounds more were taken, when she became too feeble to bear any further evacuation, and the remainder was drawn off the next day to the amount of ten pounds more—being twenty-five pounds in all. This fluid was discharged through an aperture in the umbilicus, which was at the extremity of the tumor. But what involves the whole subject in mystery, is, this fluid was *milk* ! and without any disagreeable odor, more than if taken warm from a cow.

I very much regret that none of it was saved for examination ; but, expecting to be present at the last drawing, I gave no particular direction, and being unavoidably absent, the whole was weighed and thrown away.

Although the woman is relieved of a great burden, and is able to walk about, she is still encumbered with the two original swellings, one on each side, which I apprehend is an enlargement of the ovaria, and consequently must render her situation deplorable for life.

From the novelty of the above case, not having met with anything of the kind in twenty-eight years' practice, I am very much at a loss to account for such a quantity of milky fluid, which must have been accumulating for about six years. It is evident it could not have been an excrementitious production, nor can I believe it to have been merely a morbid secretion, while it preserved such a mild flavor for so great a length of time. The following suggestion is offered for consideration :—As nature is ever solicitous to preserve her own established laws of order, and when she is frustrated in the perfect execution of her designs, she often makes an effort to imitate, in some way or other, what she is unable to accomplish ; and as the irritation excited by the enlarged ovaria did not produce that corresponding sympathy with the mammillary glands in exciting a secretion of milk, which is usual in a regular gravid uterus, she chose the next best method, by preparing the umbilical tumor to perform the office of a secreting lactescent organ.

Lempster, N. H. July 31, 1832.

TRUMAN ABELL.

DR. MORGAN ON SPOTTED FEVER AND MALIGNANT CHOLERA.

[To the Editor of the Boston Medical and Surgical Journal.]

Sir,—My thanks are due to you for the numbers (25) of the Journal, which arrived last week. Had it occurred to me that the letter written to Dr. Thomas Miner, 23d ult. might appear in print, it should have been more explicit. It was in answer to some questions. Excepting the word “more,” in the P. S. which should be “none,” the copy is correct.

I did not see any private patients in New York, but about fifty in the hospitals ; and to the physicians who were in attendance, we are under many obligations for their kindness in affording every facility. They were laudably exposing and fatiguing themselves in the cause of humanity.

A medical opinion on 'Cholera' may be wrong, unless founded on much experience, which I have not had: yet it is proper to state our views when called upon, freely, with of course due respect to the opinion of others; and when erroneous, we should be no less ready to give them up. As I differ from some in regard to the value of 'hospitals' for cholera patients, it is proper to add the reasons. In large cities, there always is a class of unfortunate and friendless people; when these are taken with cholera, the public asylums afford the only chance. But there are many who, though poor, are respectable, and might much sooner be attended at home; from six to twelve hours are generally lost by waiting for conveyance, besides being carried perhaps in wet weather from a half to two miles. If the city would provide funds for such articles as would be necessary; also two or more physicians in each ward, as might be required, my opinion is, more lives would be saved. Most of the cases I saw in New York were beyond the reach of medicine, when they arrived at the hospitals. We should not think of waiting one minute, or of carrying a body under asphyxy from drowning, a mile, if a bed, &c. could be got nearer. The same danger attends both cases when time is lost; and my opinion is, nearly the same treatment is proper.

The disease we had last spring was called Spotted Fever, though there were neither spots nor fever, as the name would imply. It commenced sporadically, early in March, and continued so to the last of April, when it became epidemic, and about 150 cases occurred in five days. It then subsided rapidly, but has shown itself occasionally in and around this place, up to this time. Premonitory symptoms were seldom inquired after or noticed, though I know debility, with pain in the head and at the epigastrium, was common for six to twenty-four hours before excessive prostration, or what is called collapse,* came on. We were seldom called before, but always early in, this stage, when violent convulsions were generally seen, in females strongly mixed with hysteria. These did not last long. The pulse was weak or gone; skin and tongue cool, or cold, the latter large, flabby, and covered with a light fur and mucus; puking common; great distress and pain at the epigastrium; paucity of urine common, also numbness of the limbs. Some wanted cold water exceedingly. In very bad cases, the skin had a brownish purple appearance, especially about the fingers, hands, and extremities; it was cold, but very seldom a cold sweat.

Our treatment was from one to five grains of opium to allay puking, convulsions, or pain; sometimes mustard, or a blister over the stomach, to check emesis; place the patient instantly on a feather bed, with from three to six blankets over him, and give a hot brandy sling; then put from two to twelve hot bricks, wrapped in flannel wet with vinegar, around the body and limbs, to rouse the pulse, and bring on free diaphoresis. This was repeated or diminished, according to circumstances. Reaction came on in from two to twenty-four hours, and any relaxation endangered the patient. Other diffusible stimuli were sometimes used, but never in excessive quantity. We had 300 cases, and lost, I believe, ten. It was confined to the intemperate and lowest class in society, until its decline, when a few of the first were taken. Of those who died, excepting two, all were either intemperate, aged, or had chronic disease; one died

* Here I wish to observe, that the word *collapse*, so frequently used in cholera, does not imply any previous excitement: from the first symptom they begin to sink, and this continues to the termination in asphyxy and death, both in cholera and in the disease we had.

within four hours, the rest within twenty-four after sending for a physician.

What caused the disease, we know not ; but my opinion is, the same cause is now operating in New York, and there develops 'cholera.' I have stated it has continued up to this time. It is now combined with violent cramps in the calves of the legs, and in some there is also pure opisthotonus ; but what is singular, some of these patients were taken while attending a family lately from New York (a few days after arriving, three of them were attacked with 'cholera,' as I saw it there).

If my observation is correct, fevers and other diseases are strangely altered this season at this place ; they sink much more rapidly, and, if favorable, recover much sooner than formerly. We have not rules, but there are general principles to guide us ; and when physicians agree in proscribing everything that can in any way debilitate the system, as predisposing to an attack of cholera, why not apply it to the treatment also ? It has occurred to me, that inhaling oxygen gas, or the nitrous oxyd, might be useful in these cases of asphyxy.

I am, Sir, your servant,

New London, Aug. 7, 1832.

JAS. MORGAN.

BOSTON MEDICAL AND SURGICAL JOURNAL.

BOSTON, AUGUST 15, 1832.

THE CHOLERA.

AMONG the laws which appear to govern this singular disease, not the least remarkable is its tendency to a regular increase and decline, in each city which has been visited by its presence. This circumstance has indeed been observed of the various epidemics which have, at different periods, visited the human race. It was observed of the plague in London, in 1666, that, just when the frightful mortality had rendered the inhabitants utterly desperate, and it began to be believed that the whole city was devoted to utter destruction, the disease, without any apparent atmospheric cause, began to abate, and the diminution of the mortality exhibited the same regularity which had been manifested by its increase. In regard to cholera, this correspondence is often more remarkable ; and at equal distances of time from the period of the maximum, the intensity of the disease will appear to be nearly equal. As an instance of this, we may quote the following record respecting the appearance of the disease in Bombay, where it continued severe through the short space of 11 days. 1820, May 1, 17 deaths ; on the 2d, 34 deaths ; on the 3d, 34 deaths ; on the 4th, 30 deaths ; on the 5th, 56 deaths ; on the 6th, 81 deaths ; on the 7th, 52 deaths ; on the 8th, 51 deaths ; on the 9th, 54 deaths ; on the 10th, 48 deaths ; on the 11th, 24 deaths.

The period, which is required by the disease to run its course, is like-

wise a subject worthy of notice. This is found to vary considerably in different places, and is influenced probably by many circumstances which are unknown to us ; but it seems, in general, that the period of continuance is longer in large cities than in small. As an instance of the variety which has occurred in places similarly situated, we may mention that in 22 towns in Russia, which were attacked about the same time, the smallest period reported is 7, the largest 80, and the average duration 32 days.

To account for the course which the disease takes in this respect, the following theory has been resorted to, by an ingenious defender of the contagious doctrine, Mr. Kennedy. In every large town which has not been invaded, there will be a considerable proportion of the inhabitants in a state of predisposition. As soon as the cholera arrives, it begins to spread among the persons so predisposed, and it will continue to spread rapidly, until the whole of these are infected, or until such time as their predisposition is destroyed by seasoning. After this period, very few cases comparatively occur, and the subjects of those that do occur, are chiefly strangers, who have come from a healthy locality, or residents who have had their seasoning immunity destroyed by a more than common degree of exposure to strong predisposing circumstances, as great fatigue, or great constitutional debility. Whatever may be thought of this theory, the general fact that the average duration of the disease is from five to six weeks, is amply confirmed by experience ; and this fact is important to be kept in view, as it may inspire hope and encouragement at the time when their support is most needed. At New York, the disease appears to have reached the maximum in about 20 days ; and supposing the decline to occupy an equal period, it is obvious that the duration in that city will correspond very nearly to the average just mentioned. Should it come among ourselves, we may hope that it will conform to a similar law ; and when we have watched its progress for three weeks, there will be reason to suppose that the degree which it has then attained, will be the ultimate extent of its destructive ravages.

CHOLERA OINTMENT.

It has been mentioned in this Journal, that an external application, consisting of mercurial ointment, camphor, and cayenne pepper, had been tried in New York, with very happy effects. The following letter from Dr. Lee, of the Greenwich Hospital, contains a detailed account of this mode of treatment, as practised by him, and will be found highly interesting.

MY DEAR DOCTOR,—Your letter of the 20th came yesterday.—I am excessively hurried, and cannot write you as I would wish. As to our treatment, I trust we have at length hit upon a plan which leaves nothing

more to be expected in the way of therapeutics. In the early stages, our practice is not peculiar; we have employed the usual means, and our treatment has been uniformly successful. It is only in the stage of collapse, in which most of our patients are brought in, that we have experienced any difficulty. At first we relied on powerful internal stimulants and external revulsives; but our success was small, no permanent reaction could be produced. Inhaling the nitrous oxyde and oxygen gases had no better effect. At length I concluded that there was no absorption from the mucous membrane; that from the violent action it had undergone, its functions were lost, and brought into the same condition as that of the skin. The coldness of the tongue, and the fact that hot injections were returned cold, gave great probability to the correctness of this pathological view. The only thing then left, was to undertake to introduce medicines into the circulation, mechanically through the skin. The indications were, to restore the circulation, relieve spasm, promote the action of the absorbents, and unlock the secretions. To effect these objects we prepared the following mixture—

R. Strong Mercurial Ointment, 1 lb.
Powdered Camphor, 1-2 lb.
Powdered Cayenne Pepper, 1-4 lb.

Mix well together, and have the patient rubbed all over for half an hour at a time, and repeat the operation accordingly, till the mouth is affected. The success of this plan is perfectly astonishing. Without administering a particle of medicine internally, reaction is sure to follow in from one to three hours, even in the most perfect collapse; the secretions begin to return, the evacuations become bilious, and the patient expresses himself perfectly relieved. Since we began this plan, more than two thirds of our patients have been cured—a large proportion of the rest were in a dying state when brought in. I believe the mercury is rubbed mechanically into the pores of the capillary vessels, and thus taken into the circulation. We invariably affect the mouth in from four to ten hours—then the patient is generally safe. We have lost but two where the gums were affected. In the course of my professional life, I have never been so gratified in the effect of remedial agents. The greatest sceptic in the usefulness of our science, would yield to the demonstration of such facts as our reports present.

CHARLES A. LEE.

To Dr. L. A. Smith, Newark, N. J.

SICKNESS IN LOUISIANA.

We extract the following remarks from the letter of a correspondent at Franklin, La.

It is now becoming quite sickly; the prevailing disease being the common bilious fever of the country—but in almost every instance assuming an unusually obstinate character, and exhibiting, to a greater extent than in former seasons, symptoms of gastric and intestinal irritation, which oppose the greatest obstacles to a successful treatment of the disease. Another feature in the fevers of the season, which seems more particularly to distinguish them from those of other seasons, is the early period after the accession of the disease, at which the patient falls into an alarmingly comatose state, attended with cold extremities.

SICKNESS AT CHARLESTOWN.

WE mentioned in our last that the origin of this singular disease was a mystery ; and we have now to add, that it has not yet been unraveled. Sunday, on which it commenced, was unusually warm and sultry, and the men suffered considerably from confinement in the close air of a crowded chapel. Some change had also been made in the diet of the prisoners, by the substitution of rice for potatoes ; but these circumstances furnish no adequate explanation of the simultaneous occurrence of so violent a disease. On this topic the report of the Committee will probably furnish some satisfactory information. The most remarkable circumstance attending the disease, was the profuse character of the evacuations—not less than three gallons of fluid being discharged by many in the course of a few hours ; and this although the use of liquids was nearly prohibited. The remedies principally employed were bleeding and opium. The former was resorted to in more than half the cases, and with the most marked benefit, not only in relieving the pain, but in arresting the vomiting and purging ; so that in many instances venesection alone effected an entire cure of the disease. In many cases it was found very difficult to obtain blood from the veins. During the last week cases were daily occurring in a milder form, but presenting a marked resemblance to those of Sunday. The whole number to this time has exceeded 140. No death has taken place.

SICKNESS AT SOUTH BOSTON.

ON the same day with that of the Charlestown cholera, diarrhoea appeared among the inmates of the House of Industry at South Boston. The complaint was very general in this Institution (which is an Alms House), and it is somewhat remarkable that its occurrence should be simultaneous with that at the Prison. Here too there was something unusual in the diet of the inmates—the soup having been a little richer than usual, and the brown bread sour. Whether, in either of the cases, the circumstances of diet, &c. acted as exciting causes of disease, is uncertain. It is not probable that, in any former season, or under any previous constitution of the atmosphere, so slight a cause would have produced so signal consequences ; but it is worthy of record, that of so many cases, of this description, at the present period, not one has proved fatal.

Powdered Alum, a Cure for the Toothache.—Dr. KUHN asserts that alum, finely powdered, not only relieves the toothache, but that it also arrests the progress of caries in the tooth. One or two grains are to be inserted into the cavity of the tooth, and this is to be repeated when the pain returns. In a short time the pain will cease to recur, and the chemical action which constitutes the caries will cease.—*Gazette Méd. de Paris.*

Sanguineous Tumors on the Head in Infants.—Professor Graefe, of Berlin, states that he has lately met with nine cases of the above description. Where the tumor was not very large, it has been sufficient to apply a lotion, consisting of sal ammoniac 3 ij. vinegar of squills 3 j. and six ounces of water; but where the extravasation has been more considerable, he has made a small incision with a lancet, and introduced a few threads of charpie into the wound, applying slight pressure by means of a compress and bandage.—*Journal für Chirurgie n. Augenherilkunde.*

Therapeutic Effects of Croton Tiglium.—M. Andral having prescribed frictions with the oil of *croton tiglium* to the abdomen for the purpose of inducing evacuation from the bowels, perceived that the article produced active inflammation of the skin, with a pustular eruption very similar to that of smallpox. Believing that advantage might be drawn from this in practice, M. A. applied the oil, in frictions, along the course of the sciatic nerve, in some cases of obstinate neuralgia, and with complete success. From its powerful revulsion to the skin, he has found it to be productive of utility in laryngitis and chronic gastritis.—*Gazette Médicale, January, 1832.*

The Cholera.—Another case of cholera is reported to have occurred in Newport, R. I. on Sunday last, in the person of an intemperate man between 50 and 60 years of age.—One case is also stated to have taken place in New Haven on the 7th inst., and one in Taunton, Mass. on Saturday last; both fatal.—In the city of New York, on the 11th, the number of new cases reported was 74; deaths, 33. Nine of the cases in the private practice are reported as *neglected diarrhœa*. In the Sing Sing prison, whole number of cases of cholera, 262; deaths, 84.—In Albany, Aug. 10, new cases, 19; of which 11 were severe, and 6 deaths.—The Board of Health of Troy, N. Y. report a diminution of cases. Deaths for the last 48 hours, 3. Dr. Ira M. Wells died on the 9th inst.—In Norfolk, Va. the Board of Health report, on the 6th inst. 31 new cases for the last 24 hours ending at 12 o'clock. Total deaths, 12; 3 white, and 9 colored persons. On the 7th, cases, 34; deaths, 10.—154 new cases were reported in Philadelphia on the 9th, and 58 deaths. On the 10th, new cases, 142; deaths, 39.

Notice.—We have enclosed, in this number of the Journal, the bills of some of our subscribers who are in arrears, and we take the liberty of requesting an early attention to them. Our friends must be aware that we cannot, without inconvenience, send the Journal to individuals, for several years in succession, without any compensation; and we trust that those who have thus received the work will discover no impropriety in our again reminding them of their delinquency, and of the necessity of soon discontinuing to send them the Journal, for which they seem so unwilling to pay.

To Correspondents.—We regret that want of room must deprive our readers, until next week, of an interesting history of the cases of Cholera at Newport, with which we have been politely favored.—The communication from Dr. M. we shall endeavor to present at the same time.—Dr. SISLEY will excuse us for delaying, a week or two, the valuable practical notes he has presented for our Journal.—Other favors are on hand.

ERRATA.—On page 417, line 21, insert *of* after 'those.' Line 20, from bottom, for 'through' read 'throughout.'

Whole number of deaths in Boston for the week ending Aug. 11, 22. Males, 8—Females, 14. Stillborn, 3.

Of consumption, 1—infantile, 1—liver complaint, 1—inflammation in the bowels, 1—dysentery, 2—old age, 3—scarlet fever, 5—child-bed, 1—suicide, 1—cholera-infantum, 1—intemperance, 1—wound, 1—inflammation in the brain, 1—dropsey in the chest, 1—dropsey in the brain, 1.

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